REMARKS

(1) Applicant amends the specification herein to correct typographical errors.

(2) Claims 40-50 and 53 are currently pending in the present application. Claims 1-39 were previously cancelled and Claims 51, 52, and 54-67 are cancelled herein. Claims 40, 42-50, and 53 are amended herein. No new matter has been added. Applicants respectfully request reconsideration of Claims 40-50 and 53.

(3) Applicant submits that independent Claims 40 and 53 are clearly in condition for allowance, as will be discussed herein below. The accompanying remarks are necessary and were not presented earlier because the Patent Office had not yet cited several of the currently cited references yet. Applicant believed that the amendment filed February 28, 2006 overcame Examiner's rejections at the time. The amendments and remarks of the instant response further clarify and distinguish Applicant's invention over Examiner's new grounds of rejection and supporting reasoning presented in the final office action.

(4) The Office Action cited the following references:

A. U. S. Patent 5,527,647, by Doi, *et al.*, entitled *Phase Shift Mask And Its Manufacturing Method* (referred to as "Doi" hereinafter);

B. U. S. Patent 5,939,225, by Dove, *et al.*, entitled *Thin Film Materials For The Preparation Of Attenuating Phase Shift Masks* (referred to as "Dove" hereinafter);

C. U. S. Patent 6,242,138, by Mitsui, *et al.*, entitled *Phase Shift Mask And Phase Shift Mask Blank* (referred to as "Mitsui" hereinafter);

D. U. S. Patent 6,274,281, by Chen, entitled *Using Different Transmittance With Attenuate Phase Shift Mask (APSM) To Compensate ADI Critical Dimension Proximity* (referred to as "Chen" hereinafter);

E. U. S. Patent 6,524,755, by Jin, *et al.*, entitled *Phase-Shift Masks And Methods Of Fabrication* (referred to as "Jin" hereinafter);

F. U. S. Patent 6,677,107, by Hasegawa, *et al.*, entitled *Method For Manufacturing Semiconductor Integrated Circuit Device, Optical Mask Used Therefor, Method For Manufacturing The Same, And Mask Blanks Used Therefor* (referred to as "Hasegawa" hereinafter);

G. U. S. Patent Publication 2003/0184721, by Itoh., entitled *Mask Substrate And Its Manufacturing Method* (referred to as "Itoh" hereinafter); and

H. U. S. Patent 5,789,116, by Kim, *et al.*, entitled *Half-Tone Phase Shift Masks And Fabricating Methods Therefor Including Phase Shifter Pattern And Phase Shifting Groove* (referred to as "Kim" hereinafter).

(5) The title of the patent application was objected to in light of the prior claim amendments. The title has been amended herein in accordance with the Examiner's recommendations. Paragraphs [0006], [0008], [0031], and [0028] of the specification were objected. Applicant respectfully submits that no correction is necessary for paragraphs [0006] and [0031]. Applicant has amended paragraphs [0008] and [0028] to correct typographical errors. Applicant thanks the Examiner for his close attention to details and thorough review of this application. Applicant also thanks the Examiner for his recommendations in correcting the title and specification.

(6) Claim 51 was objected to under 37 C.F.R. § 1.75 as being a substantial duplicate of Claim 50. Applicant has cancelled Claim 51 accordingly. Applicant thanks the Examiner for his close attention to details and thorough review of this application.

(7) Claims 40-67 were rejected under 35 U.S.C. § 112, first paragraph, as assertedly failing to comply with the written description requirement. Applicant respectfully traverses these rejections for the following reasons. Applicant does not agree that the use of abbreviations after use of the full term, when clearly noted as such by parentheses, in claims causes any written description requirement issues; nor does it affect the patentability of the claims. However, simply for the sake of clarity (not for reasons of patentability), Applicant has amended the claims to use the abbreviation "attPS" rather than "APS" in accordance with the Examiner's recommendations. Applicant again thanks the Examiner for his close attention to details and thorough review of this application.

(8) Claims 41, 53, 61, and 66 were rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for a first wavelength (λ_0) of 193nm and a second wavelength (λ_t) of 157nm ($\lambda_0 - \lambda_t = 34$nm, e.g. at [0021] lines 6-9, etc.), assertedly does not reasonably provide enablement for the full scope of λ_t being at least 30nm smaller than λ_0 ($\lambda_0 - \lambda_t \geq 30$nm, as required by Claims 41, 53, 61 and 66). Applicant respectfully traverses these rejections for the following reasons.

Applicant directs the Examiner to paragraph [0028] (shown above), which sets forth the mathematical equations describing the change of attPS layer thicknesses needed to provide a desired phase shift and a desired transmittance at a new wavelength of light. In addition to the examples provided in the specification, these mathematical equations clearly provide the enablement needed by one of ordinary skill in the art to use the present invention in accordance with the claims.

(9) Claims 42 and 53 were rejected under 35 U.S.C. § 112, first paragraph, as assertedly failing to comply with the enablement requirement. Claims 42 and 52-67 were rejected under 35 U.S.C. § 112, second paragraph, as assertedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses these rejections for the following reasons. Applicant has amended Claims 42 and 53 to remove any references to "L_0," "L_1," and "L_2" herein. These were typographical errors that should not have been included in the claims, nor in the specification (deleted from paragraph [0028] herein also). Applicant has also amended the definition of the variable T_t in Claims 42 and 53. Claims Applicant has canceled Claims 52 and 54-67. Applicant yet again thanks the Examiner for his close attention to details and thorough review of this application.

(10) Claims 40-41 and 44-51 were rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Dove or Mitsui and further in view of Chen. Claims 42-43 were rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Dove or Mitsui, further in view of Chen, and further in view of Jin. Claim 52 was rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Dove or Mitsui, further in view of Chen, and further in view of either Hasegawa or Itoh.

Claim 53 was rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Dove or Mitsui, further in view of Chen, further in view of Jin, and further in view of either Hasegawa or Itoh.

Regarding obviousness, MPEP 2143 (8th ed., rev. 4, Oct. 2005) states:

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.
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> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claims 40-50

For the Patent Office to establish a *prima facie* case of obviousness against Claims 40-50, it must show how or where the cited references (alone or combined) teach or suggest ***all*** the claim limitations of Claims 40-50, as currently amended. This is the third requirement in the Patent Office's burden to establish a *prima facie* case of obviousness. Based on the following, Applicant respectfully asserts that Claims 40-50, as amended herein, are clearly not obvious in view of the cited references.

The cited references, either alone or in combination, do not teach, suggest, or motivate "obtaining a prefabricated mask blank designed for use with light of a first wavelength, wherein the prefabricated mask blank was made by a first company," "*wherein the prefabricated mask blank is adapted for etching clear areas into the attPS layer and etch stopping at the transparent so that the initial attPS-layer thickness and the clear area without attPS layer material thereat will provide a first predetermined phase shift and a first predetermined transmittance for light of the first wavelength*," and then "patterning and adapting the prefabricated mask blank to be an adapted-patterned mask for use with light of a second wavelength," "wherein the patterning and adapting is performed by a second company, the second company being different than the first

company," and where the patterning and adapting includes "reducing the attPS-layer thickness of the attPS layer to a first attPS-layer thickness at the dark areas," *and* "patterning and etching the attPS layer to form the clear areas, *wherein the attPS layer remains with a second attPS-layer thickness at the clear areas*, the second attPS-layer thickness being smaller than the first attPS-layer thickness, *wherein the transparent layer has a same thickness at the clear areas and the dark areas*," as Claim 40 requires.

In Doi, the transparent layer is etched at the clear areas to reduce its thickness relative to the dark areas. Doi actually teaches away from the present invention of Claim 40. Also, there is no mention in Doi of adapting a mask blank designed for one wavelength for use with another wavelength. Thus, Doi is not relevant here.

Dove refers to a standard use of a prefabricated mask (as described in the background of the present application while describing FIGs. 1 and 2). In Dove, there is no teaching or suggestion of providing a second layer thickness for an attenuating and phase-shifting layer (attPS layer) at the clear areas, as Claim 40 requires. Thus, Dove cannot be combined with Doi to provide this limitation because Doi does not teach or suggest this limitation either.

Nowhere in Matsui is there any mention of a method of forming a mask structure where a second layer thickness for an attPS layer remains the clear areas, as Claim 40 requires. Hence, just as with Dove, there is no basis for combining Doi (or Dove) with Matsui. A careful reading of Matsui will reveal that Matsui focuses on changing element ratios of the attPS layer material to adapt a mask design to a different wavelength of light. Thus, Matsui actually teaches away from the solution provided by the invention of Claim 40. Matsui is simply irrelevant here.

Nowhere in Chen is there any mention, teaching, or suggestion of providing a second layer thickness for an attenuating *and* phase-shifting layer (attPS layer) at the clear areas, as Claim 40 requires. A careful reading of Chen will reveal that the phase shifting material is not remaining at the clear areas. Hence, Chen actually teaches away from phase shifting material remaining in the clear areas. Thus, Chen cannot be combined with Doi, Dove, or Matsui, to provide *all* of the limitations required by Claim 40, as MPEP 2143 requires.

None of the cited references teach, suggest, or motivate a solution to the problem of using a prefabricated mask blank designed for a first wavelength of light for making an attenuating and phase-shifting mask for a second wavelength, in the way that Claim 40 requires. The invention of Claim 40 provides a unique, very useful, and non-obvious way to solve this problem. The invention of Claim 40 will allow companies to continue buying currently available prefabricated mask blanks from vendors while pushing ahead to the next generation of smaller devices using shorter wavelengths in photo-lithography, for example. None of the cited references teach or suggest a process that provides this benefit through its function.

If the rejection of Claim 40 should be maintained, it is respectfully requested that the Patent Office point out with particularity how and where the cited references, either singularly or combined, disclose, teach, or suggest *all the claim limitations* of Claim 40, as MPEP 2143 requires. In the absence of a *prima facie* showing of obviousness by the Patent Office, Applicant submits that Claim 40 should now be allowed.

Because Claims 41-50 depend from Claim 40, Applicant respectfully submits that Claims 41-50 are also patentable over the cited references for at least the same reasons discussed above for Claim 40. Thus, Applicant respectfully asserts that Claims 40-50 are patentable over the cited references.

Claim 53

Because Claim 53 includes the same limitations discussed above regarding Claim 40, Applicant respectfully submits that Claim 53 is patentable and non-obvious in view of the cited references for at least the same reasons discussed above for Claim 40.

Claims 54-67

Claims 54-55 and 57-65 were rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Dove or Mitsu and further in view of Kim. Claim 56 was rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi or Mitsui, further in view of Kim, and further in view of either Hasegawa or Itoh. Claim 66 was rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Dove or Mitsui, and

further in view of either Hasegawa or Itoh. Claim 67 was rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Doi in view of either Hasegawa or Itoh, and further in view of Kim.

Applicant has cancelled Claims 54-67 herein, and thus these rejections are now moot.

(11) In view of the above, Applicant respectfully submits that this response complies with 37 CFR § 1.116. Applicant furthers submit that the claims are in condition for allowance. No new matter has been added by this amendment. If the Examiner should have any questions, please contact Applicant's attorney at the number listed below. No fee is believed due in connection with this filing. However, in the event that there are any fees due, please charge the same, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

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Date

Steven H. Slater
Attorney for Applicant
Reg. No. 35,361

SLATER & MATSIL, L.L.P.
17950 Preston Rd., Suite 1000
Dallas, Texas 75252-5793
Tel. 972-732-1001
Fax: 972-732-9218